Artistry in Sound

ONKYO®

ES-600PRO

AV SURROUND PROCESSOR

Instruction Manual

• *Congratulations on your purchase of the ONKYO ES-600PRO AV Surround Processor.*
• *Please read this manual thoroughly before making connections and turning power on.*
• *Following the instructions in this manual will enable you to obtain optimum performance and listening enjoyment from your new ES-600PRO.* • *Please retain this manual for future reference.*

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eatures

- **Dolby Pro Logic Surround Sound System**
  Dolby Pro Logic Surround Sound uses an "active decoder" configuration to produce a sonic composition remarkably similar to what you'd hear in a movie theater. Its "directional emphasis circuit" adds an independently controlled "center channel" to the existing stereo L/R front channels and monaural L/R rear channel. Not just a combination of the left and right channel signals, the center channel uses logic steering circuitry that increases separation from around 3 dB to between 26 and 40 dB for pinpoint directionality, image stability and enhanced overall sound quality. So the voices of characters on the screen always come directly from the TV, never from a side speaker.
- **Four Surround Modes**
  The ES-600PRO gives the listener four kinds of surround sound circuitry to choose from in addition to Dolby Pro Logic: Dolby 3 Stereo, Hall Surround and Stadium. You can choose the mode that best matches the program material.
- **Adjustable Digital Time Delay**
  The ES-600PRO includes adjustable time delay for the rear speaker channels to let the user acoustically tailor the perceived room size to match the characteristics of the program material. This feature works with the Dolby Pro Logic, Hall and Stadium surround modes and can be adjusted either manually or via the remote control. Delay is adjustable within a range of 15 – 30 milliseconds (5 – 40 milliseconds in the Hall and Stadium surround modes). The longer the delay, the larger the apparent acoustical size of the listening room.
  Three Built-In High Power Amplifiers (Center: 50 W, Rear: 2 × 20 W)
- **Programmable Universal Remote Control Included**
  The remote control that comes with the ES-600PRO covers all major surround processor functions and is preprogrammed with control codes for ONKYO RI amplifiers, cassette decks and CD players. In addition, it can be programmed to "remember" 40 additional codes. That means the user can operate not only the audio system, but the VCR and TV set as well with a single remote.
- **Large Fluorescent Display**

:AUTION

'O REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE OVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. EFER SERVICING TO QUALIFIED SERVICE PERSONNEL."

- The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

- The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING"

'O REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT (POSE THIS APPLIANCE TO RAIN OR MOISTURE."

For models having power cords with a polarized plug.

:AUTION: TO PREVENT ELECTRIC SHOCK DO NOT USE HIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

- Sur les modèles dont la fiche est polarisée.

ATTENTION: POUR PRÉVENIR LES CHOCS ÉLECTRIQUES NE PAS UTILISER CETTE FICHE POLARISÉE AVEC UN PROLONGATEUR, UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ÊTRE INSÉRÉES À FOND SANS EN LAISSER AUCUNE PARTIE À DÉCOUVERT.

ATTENTION FOR BRITISH MODEL

- Replacement and mounting of an AC plug on the power supply cord of this unit should be performed only by qualified service personnel.
- IMPORTANT: The wires in the mains lead are coloured in accordance with the following code:
  Blue: Neutral
  Brown: Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:
The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.
The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

- This apparatus complies with requirements of EC directive 87/308/EEC.

Important safeguards

1. **Read Instructions** - All the safety and operating instructions should be read before the appliance is operated.
2. **Retain Instructions** - The safety and operating instructions should be retained for future reference.
3. **Heed Warnings** - All warnings on the appliance and in the operating instructions should be adhered to.
4. **Follow Instructions** - All operating and use instructions should be followed.
5. **Water and Moisture** - The appliance should not be used near water - for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, and the like.
6. **Carts and Stands** - The appliance should be used only with a cart or stand that is recommended by the manufacturer.

6A. An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.

PORTABLE CART WARNING

S3126A

7. **Wall or Ceiling Mounting** The appliance should be mounted to a wall or ceiling only as recommended by the manufacturer.
8. **Ventilation** - The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings; or placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.
9. **Heat** - The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.
10. **Power Sources** - The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.
11. **Polarization** - If the appliance is provided a polarized plug having on blade wider than the other, please read the following information: The polarization of the plug is a safety feature. The polarized plug will only fit the outlet one way. If the plug does not fit fully into the outlet, try reversing it. If there is still trouble, the user should seek the services of a qualified electrician. Under no circumstances should the user attempt to defeat the polarization of the plug.
12. **Power-Cord Protection** - Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.
13. **Cleaning** - The appliance should be cleaned only as recommended by the manufacturer.
14. **Nonuse Periods** - The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.
15. **Object and Liquid Entry** - Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.
16. **Damage Requiring Service** - The appliance should be serviced by qualified service personnel when:
    A. The power-supply cord or the plug has been damaged; or
    B. Objects have fallen, or liquid has been spilled into the appliance; or
    C. The appliance has been exposed to rain; or
    D. The appliance does not appear to operate normaliy or exhibits a marked change in performance; or
    E. The appliance has been dropped or the enclosure damaged
17. **Servicing** - The user should not attempt to service the appliance beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

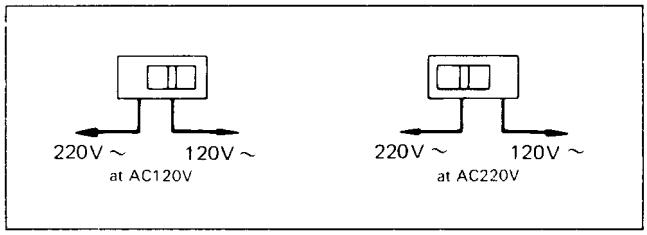
Precautions

1. **Warranty Card**
   The serial number is written on the rear panel of this unit. Copy the serial number and model number onto your warranty card and keep it in a safe place.
2. **Recording Copyright**
   Recording of copyrighted material for other than personal use is illegal without permission of the copyright holder.
3. **AC Fuse**
   The fuse is located inside the chassis and is not user serviceable. If power does not come on, contact your ONKYO service center.
4. **Care**
   From time to time you should wipe off the front and rear panels and the cabinet with a soft cloth. For heavier dirt, dampen a soft cloth in a weak solution of mild detergent and water, wring it out dry, and wipe off the dirt. Following this, dry immediately with a clean cloth. Do not use rough material, thinners, alcohol or other chemical solvents or cloths since these could damage the finish or remove the panel lettering.
5. **Power**
   WARNING
   BEFORE TURNING ON POWER FOR THE FIRST TIME, READ THE FOLLOWING SECTION CAREFULLY.

- Some models are designed for use only with the power supply voltage of the region where they are sold.

USA & Canadian models:	AC120V, 60Hz
U.K. & Australian models:	AC240V, 50Hz
Worldwide models:	120 and 220V switchable, 50/60Hz

- **Voltage Selector (Rear Panel)**
  Worldwide models are equipped with a voltage selector to conform with local power supplies. Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on. Voltage is changed by sliding the groove in the switch with a screwdriver to the right or left. Confirm that the switch has been moved all the way to the right or left before turning the power switch on. Models without a voltage selector can only be used in areas where the power supply is the same as that of the unit.

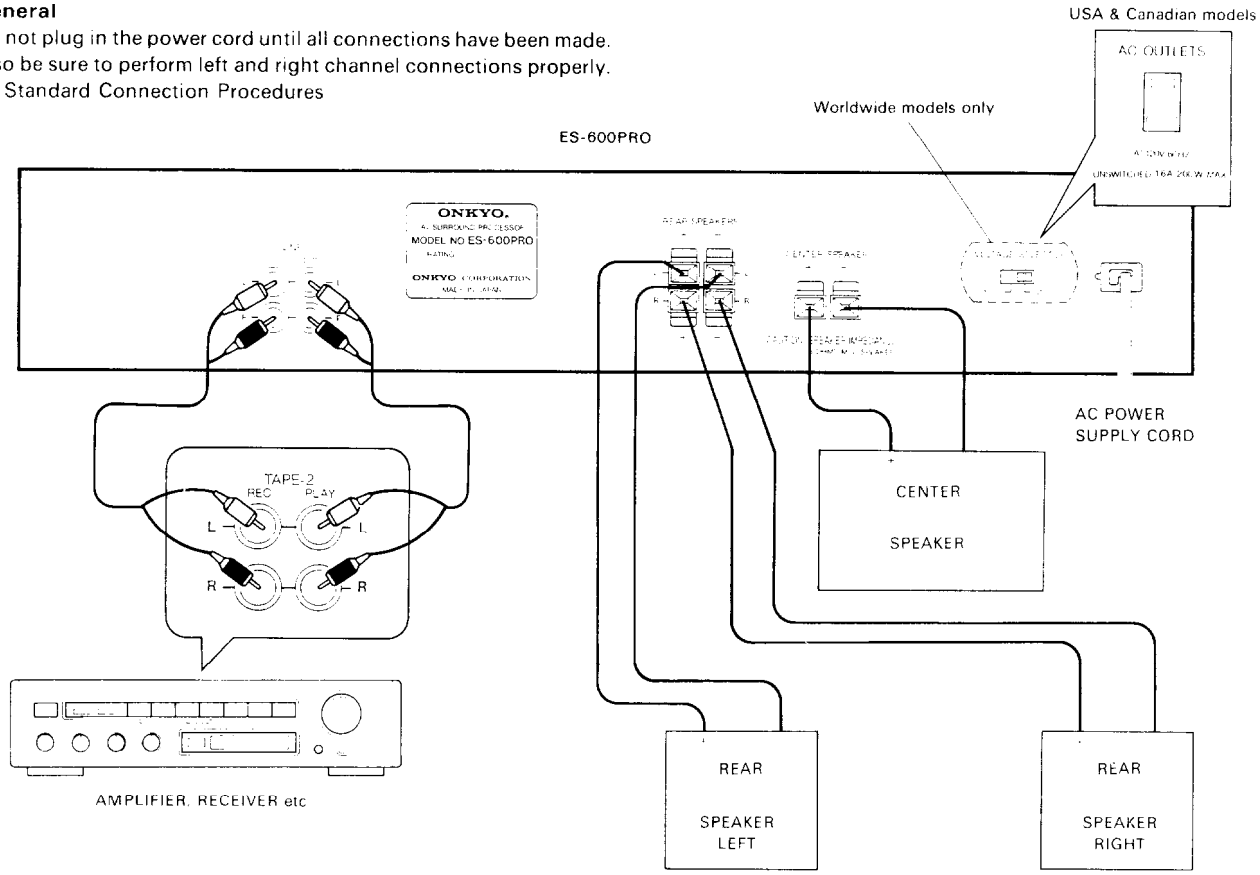


System connections

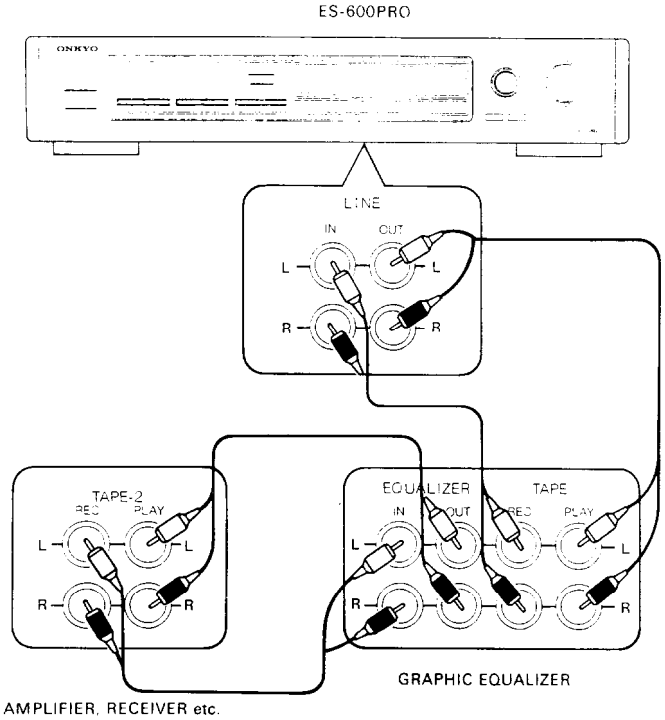
General

Do not plug in the power cord until all connections have been made.
Also be sure to perform left and right channel connections properly.

- Standard Connection Procedures



- To connect the ES-600PRO to a GRAPHIC EQUALIZER:



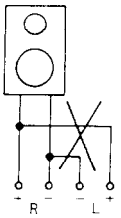
AC Outlet (U.S.A. and Canadian models)

- **UNSWITCHED:**
  This outlet is not switched on and off by the POWER switch on the front panel. Capacity is 200 watts.

Speaker Connections (SPEAKERS)

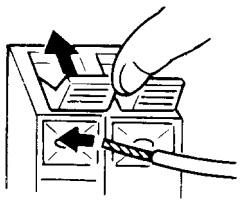
1. Connect the speakers to terminals.
2. When connecting speakers, proper polarity is important. Always connect the (+) terminal (red) on this equipment to the (+) terminal on the speaker and the (−) terminal (black) on this equipment to the (−) terminal on the speaker.
3. Do not connect a single speaker in parallel to the right and left channel outputs.
4. Use speaker cables that have a low impedance and that are as short as possible.

- Attach speaker cables to the rear panel speaker terminals with care, being sure that connections are made firmly and that there is no possibility of a short circuit occurring.



Speaker Cable Connection

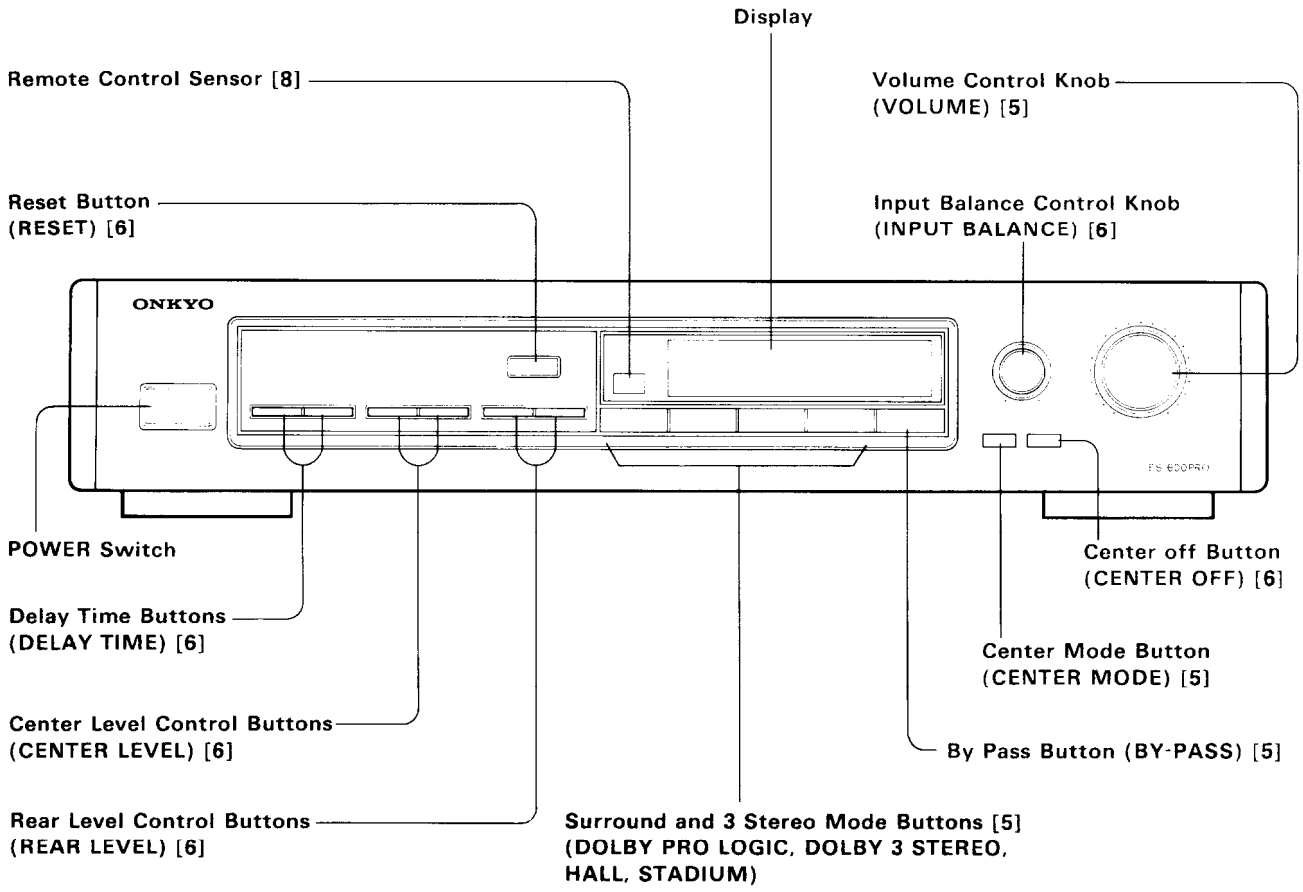
Lift the lever and insert the wire. When the wire has been inserted firmly into the hole, release the lever.



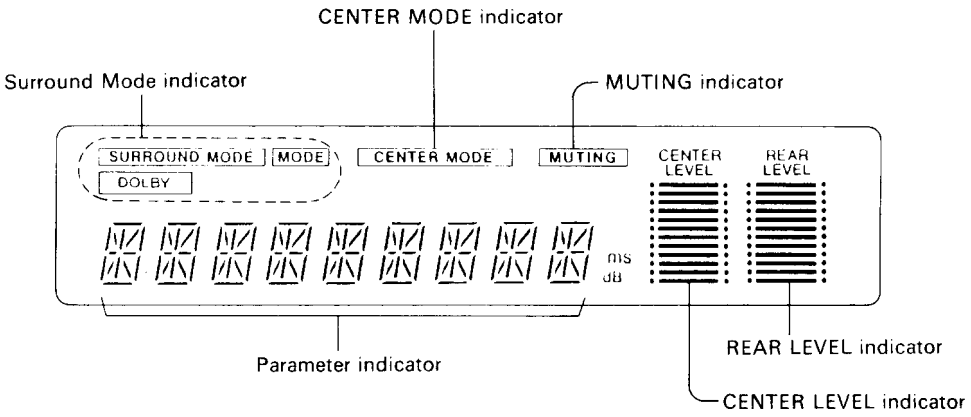
Control positions and names

Front panel

For more information about buttons or controls, turn to the page number listed in the [ ].

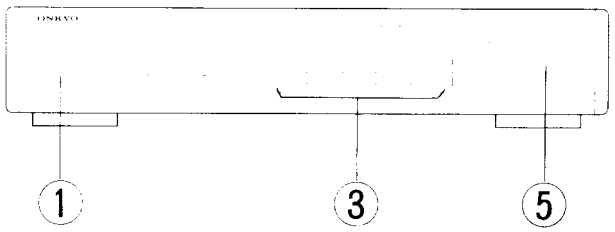

Display
Remote Control Sensor [8]
Volume Control Knob (VOLUME) [5]
Reset Button (RESET) [6]
Input Balance Control Knob (INPUT BALANCE) [6]
ONKYO
POWER Switch
Center off Button (CENTER OFF) [6]
Delay Time Buttons (DELAY TIME) [6]
Center Mode Button (CENTER MODE) [5]
Center Level Control Buttons (CENTER LEVEL) [6]
By Pass Button (BY-PASS) [5]
Rear Level Control Buttons (REAR LEVEL) [6]
Surround and 3 Stereo Mode Buttons [5] (DOLBY PRO LOGIC, DOLBY 3 STEREO, HALL, STADIUM)

Display



Operations

- This model is equipped with four different surround modes, which are selected using the Surround and 3 Stereo Mode buttons. Select the modes according to the type of program being played and the desired ambience, such as that of a movie theater, a concert hall, etc.
- This model includes a built-in Dolby Pro Logic Surround decoder. Dolby Pro Logic Surround was developed as a consumer version of the Dolby Stereo system used in movie theaters. It is suitable for playing sources recorded with the Dolby Surround system.

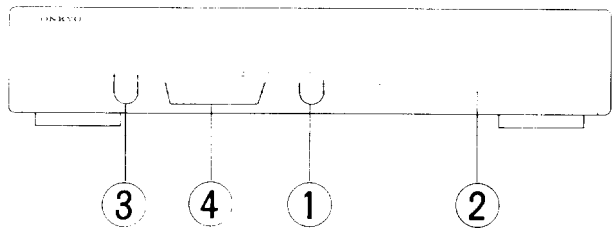


1. Press once to turn power on and once again to turn power off.
   - The display is illuminated when power is on.
2. Turn on the amplifier which is connected to this model, then select the desired input source.
3. Select the desired mode with the Surround or 3 Stereo Mode buttons.
   - DOLBY PRO LOGIC
     This mode is appropriate for playing program material that was recorded using Dolby Surround. The same thrill felt when viewing a program in a movie theater can be enjoyed when this mode is selected.

> - Commercial video sources recorded with the Dolby Surround system are indicated by the DOLBY SURROUND mark.

   - DOLBY 3 STEREO
     Where rear speakers are not available, DOLBY 3 STEREO provides partial reproduction of the Dolby Pro Logic Surround capabilities using only the 3 front channels (left, right and center). For only the 3 front channels, the directionality enhancer circuit allows the shifting sound feature of Dolby Pro Logic Surround to be enjoyed.
     The surround signal is reproduced at an appropriate distance between the front left and right speakers.
     Use of the rear speaker system is recommended for full enjoyment of Dolby Pro Logic Surround.
   - HALL
     This mode is suitable for classical and other types of music characterized by its many sound reverberations.
   - STADIUM
     Actual movie theaters use many rear speakers. These modes are designed to replicate this atmosphere. They are suitable for playing program material that was recorded using Dolby Surround.
   - BY-PASS
     The surround mode is not used. Audio input signals (left and right) are conveyed directly to the front speakers without sound modification.
4. Start play of the selected input source.
5. Adjust the Volume Control knob of this model or the amplifier which is connected to the appropriate level.

Surround Adjustments



1. Select the desired mode with the Surround or 3 Stereo Mode buttons.

Pro Logic Modes

- DOLBY PRO LOGIC
  Set to this mode for normal Pro Logic playback.
- DOLBY 3 STEREO
  When not using rear speakers, set to this mode.

2. Pressing the CENTER MODE button shifts the center mode in the sequence indicated.

Center Modes

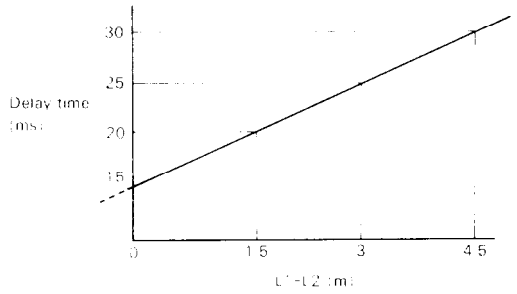
Dolby Pro Logic Surround requires a center speaker for reproducing the center signal. The mode should be selected based on the type of center speaker used.

- NORMAL
  The center speaker is smaller or otherwise less able than the front speakers to handle bass frequencies. The center signal is divided so that sounds above 100 Hz are reproduced by the center speaker and those below are applied to the front speakers.
- WIDE BAND
  In this case, the bass response of the center speaker system is essentially equal to that of the front speakers. The center channel sound is completely applied to the center speaker.
- PHANTOM
  Select this mode if a center speaker is not used. The center channel sound is applied to the front speakers.

3 Press the DELAY TIME (+, −) button

DELAY

With certain programs, sounds that should be heard from the rear emerge from the center, or vice versa. In such cases, the delay time can be adjusted for the correct sound positioning. The standard setting is 20ms, but if correction is needed, select from among 15, 20, 25 and 30ms. However, to optimize the surround effect, determine the setting from the relationship indicated in the figure.
The delay time cannot be set during DOLBY 3 STEREO.



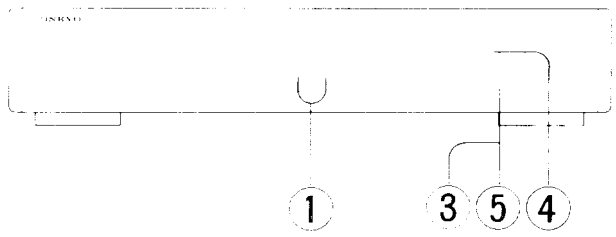
L1: Distance from center speaker to listening position
L2: Distance from rear speaker to listening position

NOTE:

The delay time changes from 5 ms to 40 ms, if Hall or Stadium mode is selected

Input Balance Adjustment

During DOLBY PRO LOGIC SURROUND playback, if conversation which should be heard directly from the center is off to either the left or right, the INPUT BALANCE Control Knob can be used to adjust the balance as follows.



1 Press either the DOLBY PRO LOGIC Button or the DOLBY 3 STEREO Button
- The Input Balance is in operation while the DOLBY PRO LOGIC and DOLBY 3 STEREO Surround modes are in effect.

2 Play back a source from which the conversation can be heard directly from the front.
3 Press the CENTER OFF Button on the unit
- The sound from the center speaker will no longer be heard.

4 Using the INPUT BALANCE Control Knob, adjust until the sound of the voice reaches its minimum level.
5 Press the CENTER OFF Button of the unit.
- The sound from the center speaker will be audible again. This completes the adjustment.

4 Press the TEST button on the remote control transmitter.
The best effect is obtained from the Dolby Pro Logic Surround when the volume is balanced among the speakers.

A. TEST

- Set it to a low position in order to avoid a sudden occurance of high volume when beginning operations with the test tone.
- When the remote control TEST button is pressed, the tone emanates from the speakers in the sequence Front Left (L) → Center (C) → Front Right (R) → Rear (S)....
From the listening position, use the CENTER and REAR LEVEL buttons to adjust for equal test tone volume on each channel.
- In the PHANTOM center mode the test tone alternates between the front (left and right) and rear channels.

5 Pressing the TEST button again will turn off the test tone.
- The test tone continues for 1.5 seconds on each channel for a total speaker system check time of 90 seconds.

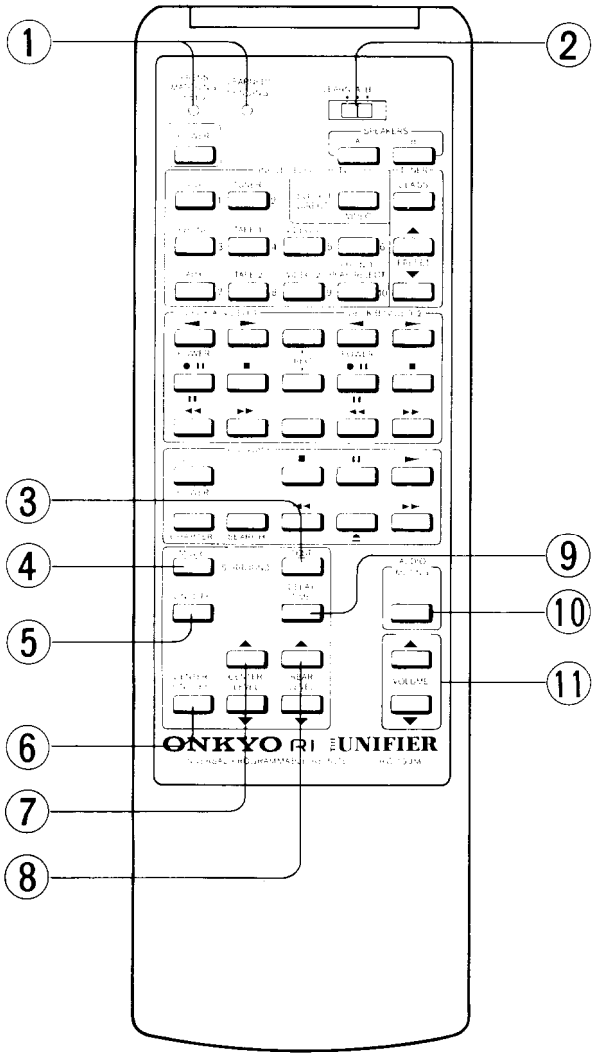
When the RESET Button is pressed, the values set for DELAY TIME, CENTER LEVEL, and REAR LEVEL when making the surround adjustments are returned to their initial values.

NOTE:

When using HALL, STADIUM or BY-PASS, set the INPUT BALANCE Control Knob to the center position.

Section Names and Functions (Remote Control Transmitter)

Remote Control Transmitter (RC-199M)



The following buttons are used to control the ES-600PRO

① **Operation Indicators**
The two indicators function as guides when codes are stored in the remote control transmitter. If the encoding process is incomplete or the battery depleted the LEARNED/SENDING indicator will flash whenever a button is pressed.

② **LEARN/A/B Switch**
A: Set to this position during operation for ③ – ⑪ buttons and other white characters.
B: In this position, all buttons are operable except ③ through ⑨ .
LEARN: Use this position to input the code of another remote control transmitter.

③ **Test Tone (TEST)**
Test tone on/off.

④ **Surround Mode (SURROUND MODE)**
Surround mode selector button. Operation is the same as that of the surround mode button of the front panel.

⑤ **Surround Mode On/Off Button (ON/OFF)**
OFF: Operation is the same as that of the BY.PASS button of the front panel.
ON: The status prior to turning the mode off is resumed.

⑥ **Center Speaker On/Off Button (CENTER ON/OFF)**
Turns the Center Speaker on and off when adjusting the input balance.

⑦ **Center Level (CENTER LEVEL ▲ / ▼)**
Adjust the center speaker volume.
▲ : Increases the volume
▼ : Decreases the volume

⑧ **Rear Level (REAR LEVEL ▲ / ▼)**
Adjust the rear speaker volume.
▲ : Increases the volume
▼ : Decreases the volume

⑨ **Delay Time (DELAY TIME)**
Use this button to select the delay time.

⑩ **Muting Button (AUDIO MUTING)**
Press to activate muting and cut off the sound. Press again to deactivate the muting and return to original volume level. Switching off power to the unit also deactivates the muting.

⑪ **Volume Control (VOLUME ▲ / ▼)**
Adjust volume level
▲ : Increases the volume
▼ : Decreases the volume

Using the remote control transmitter

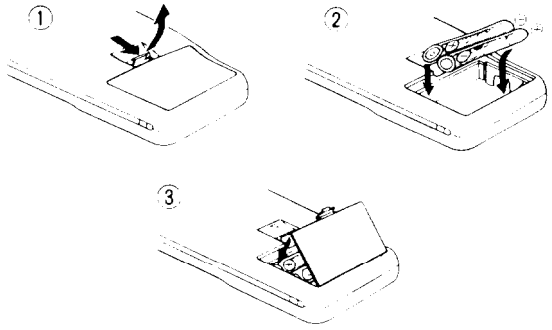
- For details on the function of each control, see the description in "Remote Control Transmitter" (RC-199M) on page 7.
- **Batteries**
  The remote control transmitter is powered by two batteries. Before using this unit for the first time, insert the two batteries (included) as shown in the diagram. The remote control transmitter has no on/off switch. Average battery life is one year. This period may be shorter depending on the frequency of use and environment (temperature and humidity) in which the remote control transmitter is used. If the remote control transmitter does not operate even though front panel controls function normally, the batteries should be replaced. Use only batteries listed in the following chart.

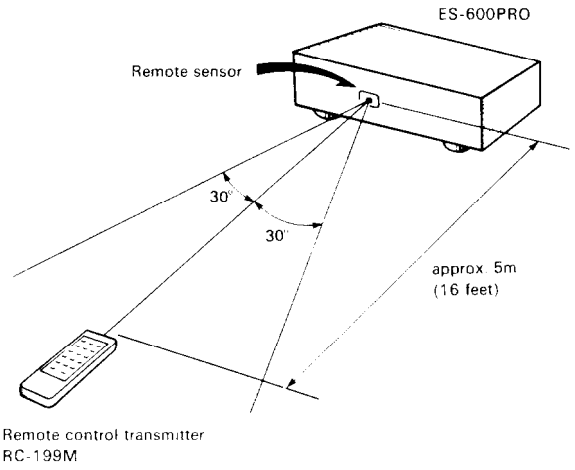
Type	Voltage	Size
Manganese	1.5V	AA R6 UM-3

NOTE:

1. Do not leave an expired battery in the case as it may leak or damage the battery case.
2. When inserting the batteries, be sure the (+) and (−) ends are properly aligned.
3. Do not use nickel-cadmium (rechargeable) batteries.
4. Do not use one specified (manganese) battery and one alkaline battery at the same time.
5. *Replace both batteries at once; do not use one old and one* new battery together.

Transmitter Battery Replacement





Remote control transmitter
RC-199M

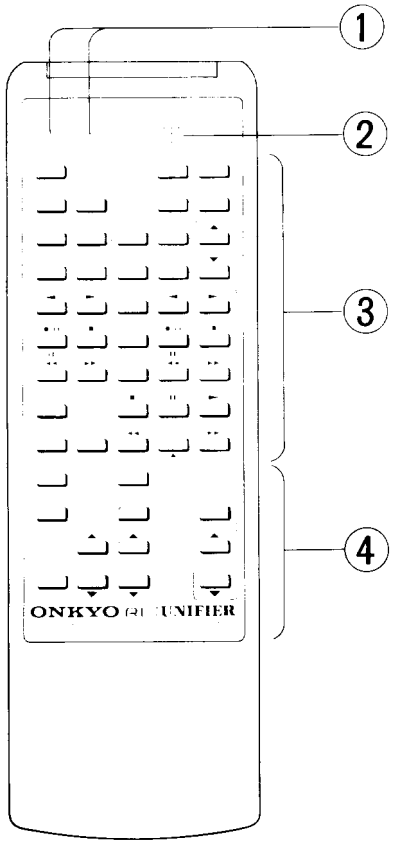
- Precautions

1. Remove the batteries if the remote control transmitter is not going to be used for a long time.
2. The batteries of the remote control transmitter must be replaced periodically. Remember, however, that commands will be received only when the main power switch of the ES-600PRO is on.
3. This unit uses infrared rays. Therefore, commands may not be received properly if the front panel of the ES-600PRO is exposed to bright light. To prevent this from occurring, place the *ES-600PRO so that it is not directly exposed to a bright light.*
4. If the ES-600PRO is placed inside an audio rack behind a glass door, the door should not use colored glass or have any decorations on it since this could shorten the range or prevent commands from being received.
5. Use of other infrared remote control devices in the same room may cause interference.
6. *The transmitter operates up to a distance of about five meters* (16 feet). The transmitting window must always be pointed at the reception window when a command is sent to the ES-600PRO.
7. If this remote control transmitter does not operate properly, confirm that the batteries are not dead. If the problem persists, contact your ONKYO service center.

Remote Control Transmitter

NOTES:

- Commands of systems with the ONKYO RI mark are already stored at the A position and part of the B section of the LEARN/A/B selector switch. There is no need to "learn" them. (The RI mark is ONKYO's own mark).
- If necessary, the buttons in the following figure marked with number 3 can be placed in the memory with a different code. Blue characters are used to input codes into the memory. Set a code on your existing remote control to an appropriate blue character. When using the memory the LEARN/A/B switch must be on A.
- The output of most infrared remote control transmission units on the market today consists of a series of pulses (codes). By changing these codes, functions can be differentiated between products of different manufacturers. In order to operate certain functions, the codes of that particular unit have to be assigned the same code for the function to work correctly.



① **Display Indicators (PRESS MATCHING KEYS, LEARNED/SENDING)**
These indicators act as guides when this unit "learns" and "uses" commands. They also warn the user when an error is made or when battery power is low.

② **Learn/A/B Selector Switch (LEARN/A/B)**
Set this switch to A or B when operating. Set the switch to LEARN for memorizing other remote control codes.

③ These buttons are for operating other ONKYO products that have the RI mark (white characters). They can be operated at either A or B settings of the LEARN/A/B switch (white characters). These buttons are capable of learning.

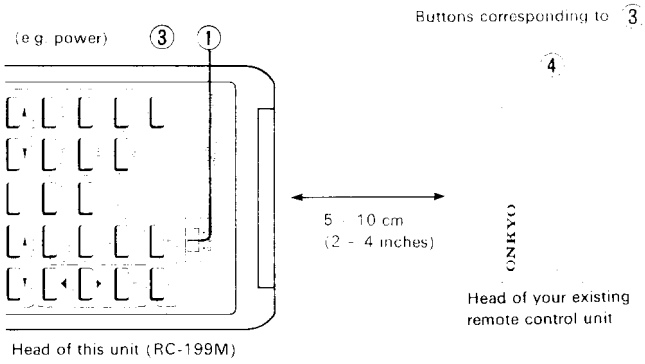
- Operate Deck-B, if a single deck is used.

④ These buttons are for operating this model. They can be operated with the LEARN/A/B switch set to A. For a detailed description, see page 5.

- The Audio Muting button and Volume button can operate the ES-600PRO in the A position, and these buttons can also be used for operating other equipment when in the B position.

How to Learn (Applicable only to A side)

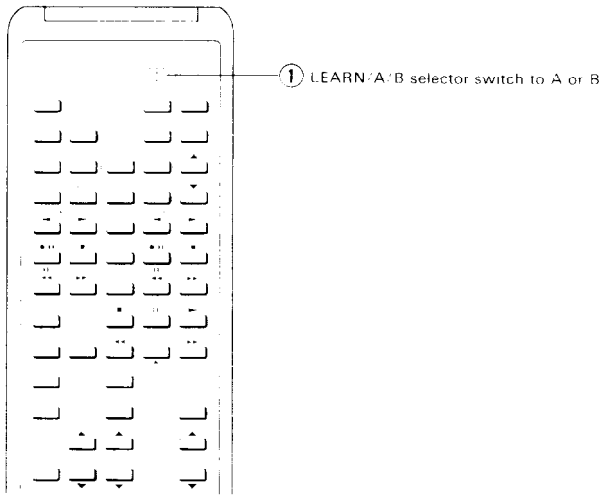
① Set the LEARN/A/B selector switch to LEARN.
② Place the head of your existing remote control unit 2 – 4 inches (5 – 10 cm) from the head of this unit, laying both units on a table or another flat surface.
③ Press the button of this unit into which you want to memorize the code. The "PRESS MATCHING KEYS" indicator lights.
④ Hold down the button you want to memorize on your existing remote control unit while the "PRESS MATCHING KEYS" indicator is lighted until the LEARNED/SENDING indicator lights.
⑤ To continue the process and memorize another key, repeat steps ③ – ④.



NOTES:

- Some remote controllers use a single button to change codes, with the code changing each time the button is pressed. If you are using this kind of controller, please perform "learn" functions for each of the buttons individually, one function to one RC-199M button.
- This remote control transmitter uses infrared rays. Most remote control codes can be memorized using the infrared system; however, depending on the degree to which the system differs, there are some rare occasions where memorization is not possible.
- Be sure to assign functions to the buttons with the corresponding function names and/or symbols. If functions and button names are different, the function which actually operates will be different from that which is displayed. For instructions regarding the operation of "learned" units, please refer to the individual instruction manuals for each product.
- Even after codes have been memorized, please keep your existing remote control transmitter in a safe place. If the memorized codes are lost when the batteries run down, etc., it will be necessary to memorize them once again using the existing remote control transmitter.

Operation



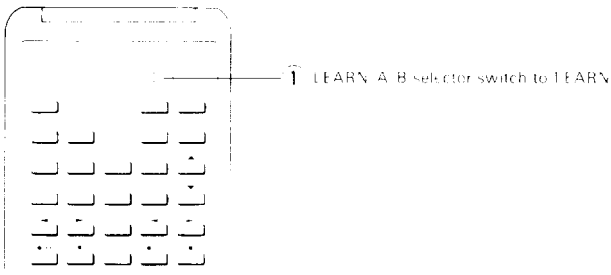
1 Set the LEARN/A/B selector switch to either A or B. Then operate the remote control transmitter by pressing the buttons of the functions you want to use.

- There is no power switch on the remote control transmitter. Power is supplied automatically when a button is pressed. If no button is pressed for a short interval, power goes off automatically, to avoid wasting the battery.
- If you press a button at which no code has been memorized, the "LEARNED/SENDING" indicator will not light up.

NOTE:

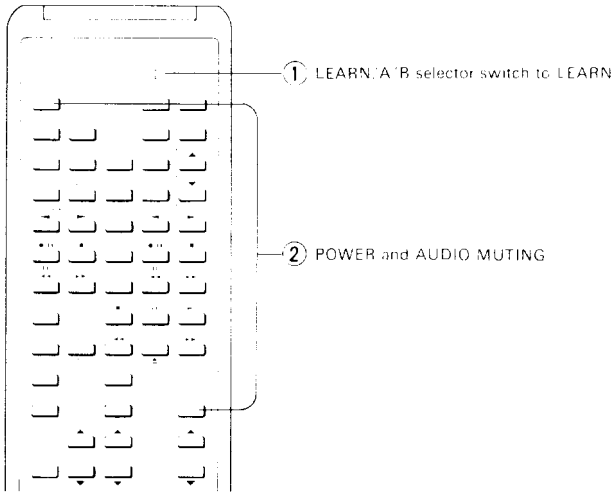
Please check whether previously memorized functions are working properly. The sending indicator may not be illuminated with your existing remote control unit.

Changing Commands



1 Set the LEARN/A/B selector switch to LEARN.
2 Commands should be memorized using the system outlined in the section, "How to Learn." New codes of newly entered buttons only are modified, and the codes of previously memorized buttons are not modified.

How to Reset the RC-199M (Clearing All Memorized Commands)



1 Set the LEARN/A/B selector switch to LEARN.
2 Hold down both the POWER button and the AUDIO MUTING at the same time. Continue holding these buttons down until the PRESS MATCHING indicator and LEARNED/SENDING indicator light up and are then turned off.

- When the indicators are turned off, the reset operation is completed.
- When the A section is reset, the preset ONKYO codes will be recalled.

If the Indicators Flash

1. During learning, the indicators flash when the same codes are stable and cannot be memorized multiple times. To ensure the reception of stable codes, place both remote control units on a table or other level surface and position them at a fixed distance and orientation.
2. The indicators may flash in case an audio device can be controlled by the existing remote control unit but the codes cannot be memorized by the RC-199M. This is because the RC-199M requires highly stable transmission output for identifying codes. Replace the batteries of the existing remote control unit with new ones, then repeat the learning operation.
3. If the indicators flash when a button is pressed, it means that the RC-199M batteries are worn out. Replace its batteries with new ones.

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Trouble shooting guide

- If this model appears to be malfunctioning. Make sure the connecting cables and the speaker cables are connected correctly. See page 3, "System Connections".

Trouble	Cause	Remedy
Power on but no sound	● AUDIO MUTING switch on. ● The VOLUME control may be set to "0".	● Switch to off by remote control transmitter. ● Adjust for an optimum sound level.
Center speaker sound is absent or weak.	● Surround mode set for BY-PASS. ● Center level is at minimum. ● Center mode set for PHANTOM. ● CENTER OFF button on.	● Set for the surround mode. ● Adjust for suitable center level. ● Set center mode for NORMAL or WIDEBAND. ● Button to off.
Rear speaker sound is absent or weak.	● Surround mode set for BY-PASS. ● Rear level is set to minimum. ● Pro Logic mode set for DOLBY 3 STEREO.	● Set for the surround mode. ● Adjust for suitable rear level. ● Set for DOLBY PRO LOGIC, HALL, STADIUM mode.
The test tone does not work.	● The surround mode is not set on DOLBY PRO LOGIC, DOLBY 3 STEREO.	● Set the surround mode on DOLBY PRO LOGIC, DOLBY 3 STEREO.

Specifications

Power Output: 50 watts per channel min. RMS. at 8 ohms, from 20Hz to 20,000Hz with no more than 0.09% total harmonic distortion (CENTER)
20 watts per channel min. RMS. into 8 ohms, 1000Hz with no more than 1% total harmonic distortion. (REAR)

Total Harmonic Dist.: 0.09% at rated power (CENTER)
0.09% at 1 watts output (CENTER)

IM Distortion: 0.09% at rated power (CENTER)
0.09% at 1 watts output (CENTER)

Damping Factor: 50 at 8 ohms (CENTER)

Output (LINE): 150mV (volume max.)

Sensitivity and Imp.:

Dolby Pro Logic:	200mV, 50kohms
Hall:	200mV, 50kohms
Stadium:	200mV, 50kohms

Frequency Response: 20 to 20,000Hz, +/- 1dB (CENTER)
40 to 7,000Hz, +0dB, -3dB (REAR)

Delay Time: 15 to 30ms (5ms step) (Dolby Pro Logic Surround)
5 to 40ms (5ms step) (Hall/Stadium Surround)

Signal to Noise Ratio: 80dB (IHF-A, Shorted) (CENTER)

MUTING: -60dB

Power Supply Rating:

USA & Canadian models:	AC120V 60Hz
U.K. & Australian models:	AC240V 50Hz
Worldwide Models:	120 and 220V 50/60Hz switchable.

Dimensions (W × H × D): 455 × 90 × 320 mm
17-15/16" × 3-9/16" × 12-5/8"

Weight: 6.3kg 13.9lbs.

Specifications and features are subject to change without notice.

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